REMARKS

Applicant, in response to the official action dated October 13, 2009, amended claims 1 and 36. These claims include limitations and clarifications that the nanofibers have a thickness between approximately 1.3 nm and 300 nm with the length/thickness ratio of a majority of the nanofibers embedded in the organic matrix being greater than 10, and that the thickness of the intermediate layer is between 0.01 mm and 0.5 mm.

The Examiner admitted that these features of the claims 9, 11, 44 and 46 now included in claims 1 and 36 had not been known from the cited existing art.

As far as the pressure of approximately 0.1 and 100 bar mentioned in claims 1 and 36 is concerned, the Examiner had argued, that this pressure was known from US 7,144 624 B2 (Knowles) teaching "a few psi pressure" in column 8, line 59. The interpretation of the Examiner is not correct, as this passage of US 7,144,624 B2 does actually not teach a pressure range of 0.1 and 100 bar.

1 psi is $6{,}895 \times 10^{-2}$ bar. A few psi could, for example, also mean pressures lower than 1.0 psi, for example pressure of 0.5 psi, and this is much less than 0.1 bar. Therefore it is not true that US 7,144,624 B2 teaches a pressure range of claims 1 and 36.

Apart from that, the length and thickness of the nanofibers, the thickness of the intermediate layer, the length/thickness ratio, the amount of nanofibers and the pressure range are very essential parameters which must be chosen in the amount claimed in claims 1 and 36, in order to provide for an optimal heat transfer through the intermediate layer made of the conductive material.

The thermal conductivity of the conductive material is improved by the nanofibers embedded in this material by the way that some nanofibers are pressed against one surface of the heat source and/or the heat sink (heat transfer surfaces) for good thermal conductivity and by a great part of the nanofibers being oriented longitudinally perpendicular or crosswise to the adjacent heat transfer surfaces, that means in a manner for best heat transfer action. In order to obtain this, it is necessary to apply a pressure force to the intermediate layer in order to make sure that the nanofibers embedded in the conductive material abut the heat transfer surfaces of the heat sink and the heat source and also abut one another in a very tight manner.

The thickness of 0.1 mm and 0.5 mm allows an orientation of the major part of the nanofibers such that they are orientated longitudinally perpendicular or crosswise to the heat transfer surfaces with the best heat transfer orientation. Furthermore the thickness of the intermediate layer in between 0,01 mm and 0,5 mm also allows an equalization of irregularities of the heat transfer surfaces and a more uniform distribution of the nanofibers in the conductive material.

If the thickness of the intermediate layer is smaller than 0.01 mm the uniform distribution of the nanofibers in the conductive material of the intermediate layer becomes difficult or is not further obtained and an orientation of the nanofibers with their longitudinal axis perpendicular or crosswise to the heat transfer surfaces is not possible at least for the major part of the nanofibers.

If the thickness of the intermediate layer is more than 0.5 mm, the pressure exerted on the intermediate layer must exceed the maximum pressure value mentioned in claims 1 and 36.

If the amount of nanofibers in the conductive material is too small, namely less than 5 percent there will be no real improvement of the thermal conductivity. If the amount of nanofibers in the conductive material is to high, that means more than 20 percent, it is difficult to apply the conductive material to the heat conductive surfaces of the heat source and to the heat sink and is also not possible to keep the thickness of the intermediate layer in the preferred arrange in between 0.01 mm and 0.5 mm. This means, that the parameters mentioned in the claims 1 and 36 are balanced one to another in an optimum manner.

An apparatus with the features of claim 1 and a thermally conductive mass with the features of claim 36 had not been known or obvious from the cited art. Reconsideration of the refusal to approve the claims as presently on file is respectfully requested.

Respectfully submitted,

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